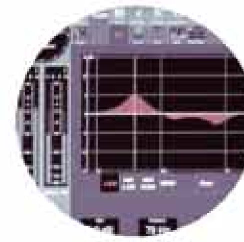
STUDER by HARMAN









OnAir 2500

Compact Digital Broadcast Console

All-in-one Design

The Studer OnAir 2500 ensures a new standard in ease-of-use for Radio or TV Broadcast, and is available in both a fixed frame model for portability, or the Modulo version for recessed installation in studio furniture.

Designed as an integrated system – on the Fixed Frame model the control surface, I/O breakout, DSP and controller boards, as well as power supply, share the same chassis – it addresses the medium segment of the live broadcast market including both private and public network stations. Its self-contained architecture without an external core reduces wiring complexity and setup time to a minimum. This makes the OnAir 2500 the ideal audio mixing console for OB applications, where robustness and reliability are a must.

The Modulo version simply offers the same functions in separate modules which are easily connected together when installed in tabletop furniture.

Studer's OnAir 2500 user-interface builds upon the highly acclaimed operational concept of the OnAir 2000 and OnAir 3000.

Having been introduced to the market with the very successful OnAir 2000, Studer's patented "Touch'n'Action" philosophy is incorporated into the OnAir 2500.

The OnAir 2500 even runs the same mature software platform as the OnAir 3000. Full compatibility with other systems of the OnAir family and a short learning curve for operators with OnAir 3000 experience are only two of many advantages.













OnAir 2500 Modulo.
For installation in tabletop furniture



OnAir 2500 Key Features:

- 12, 18 or 24 fader layout with motorised or non-motorised 100mm faders
- Touch sensitive, central 12" coloured screen with 4 encoders for parameter adjustment
- OLED (Organic LED) in fader and central module for clear readability
- Ergonomic, easy to learn Touch'n'Action user interface
- Complete integration with Radio Automation Systems
- Integrated monitoring system
- 8 stereo N-1 busses
- Built-in full channel deesser, limiter, compressor, expander and gate with 4-band parametric EQ





OnAir 2500 Modulo system installed at Studio 105, Zurich

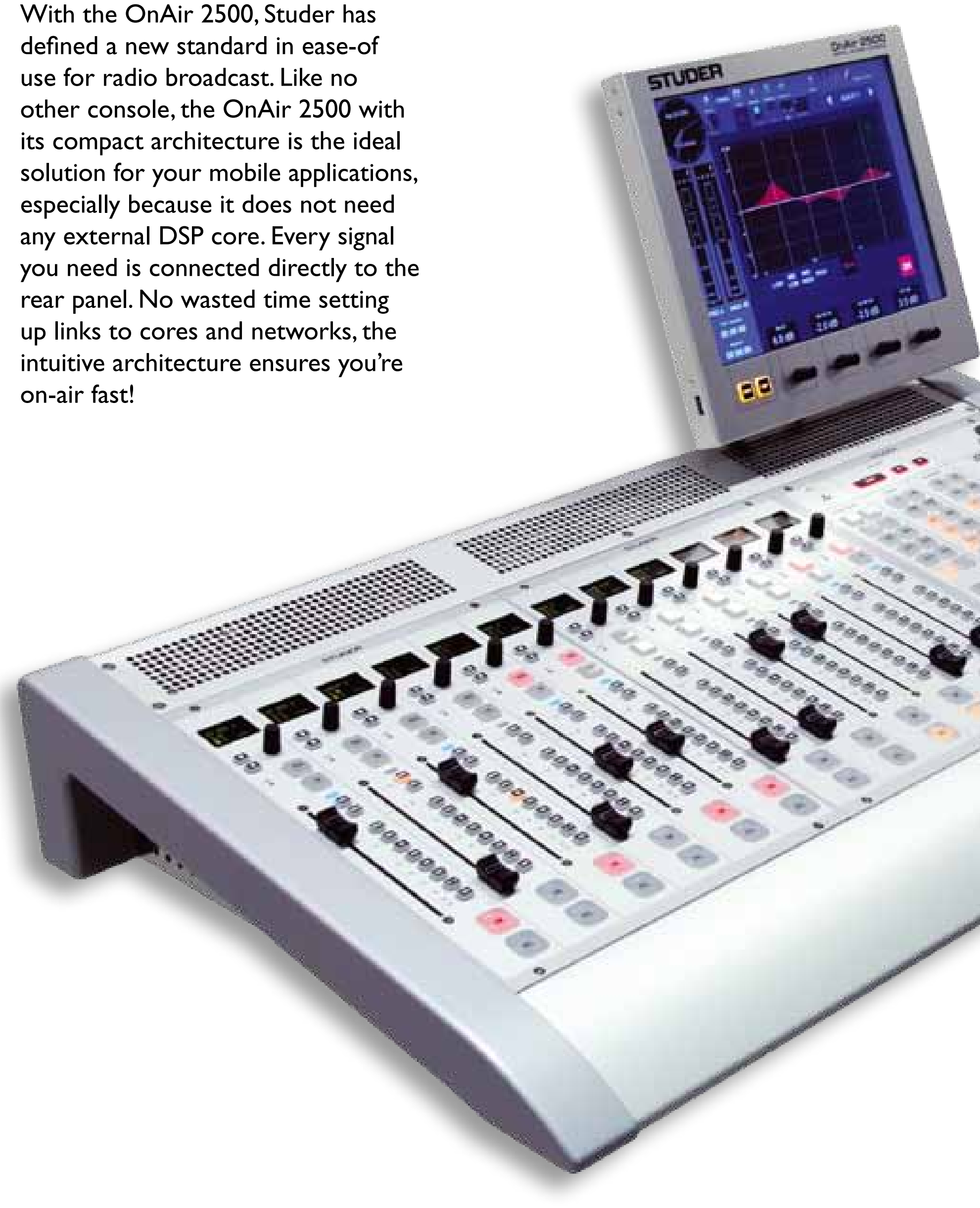
Ready For Broadcast – Whenever And Wherever You Want

Like all other products in Studer's OnAir portfolio, the OnAir 2500 provides you and your operators with a wide and well-balanced broadcast feature set. Typical functions for your every day work, like muting the monitor speaker signal while microphones are open, are already integrated and need not be configured, saving time and money. Nonetheless, nearly all functions can be easily activated, deactivated or customised using the configuration user interface on the main screen.

The ergonomic design and the simple usability of the OnAir 2500 means that it's ideally suited to stressful live on-air operation. Being under continuous time pressure, the DJ can change from live presentation to off air recording, from pre-conferencing to OB connections. This is where simple and intiutive operation have highest priority. The OnAir 2500 is entirely geared to let your talents do their job: making radio.

The OnAir 2500 supports your daily work even more. In most installations, the console will be operated in a multiuser environment Therefore, you can create user accounts defined with individual access restrictions on specified console functions. This applies as well for the system snapshots, which are stored internally and contain custom sets of signal parameters, crosspoint settings and channel assignment. According to the configured rights, users may have access to only a limited number of snapshots. Independently, it is possible to store snapshots externally on a USB memory stick, connected to a socket on the main screen.

With the OnAir 2500, Studer has defined a new standard in ease-of use for radio broadcast. Like no other console, the OnAir 2500 with its compact architecture is the ideal solution for your mobile applications, especially because it does not need any external DSP core. Every signal you need is connected directly to the rear panel. No wasted time setting up links to cores and networks, the intuitive architecture ensures you're on-air fast!





Studer's OnAir 2500 is designed as an integrated system – control surface, I/O breakout, DSP and controller boards, as well as power supply, share the same chassis. Modules of 6 faders build the basis for the three available consoles sizes with 12, 18 or 24 faders. A central module in every console layout provides the operators with a monitoring section, on air indication, a talkback section and a built-in talkback microphone.

This all-in-one design is characterised by a very small footprint. The smallest version of the OnAir 2500 with 12 faders requires only 80x50 cm and the total weight of 17kgs further reinforces the mobile capability.



Pushbuttons throughout the entire console are made of silent rubber pads, guaranteeing noiseless operation and perfect tactile feedback.

Despite its compactness, the OnAir 2500 can be easily extended. When installed in a control room and connected to a voice booth, a talkback and monitoring module (A943.044400 or A943.044700) can be attached to enable communication between engineer and journalist, or even from the voice booth to any other destination, e.g. the N-X returns. Additonally, this extension includes an independent studio monitoring module with separate volume control for studio speakers and headphones.

The talkback and monitoring module is connected directly to the OnAir 2500 via ADAT (audio) and CAT5 (control). The respective interfaces on the rear panel are already preconfigured for this purpose.

To allow fail-safe operation in case of mains power loss, Studer offers an external power supply for the OnAir 2500, in a smart 1RU 19" chassis. This used as secondary feed providing 24V DC to the console.

The motorised fader module (available as part A943.061000) contains 6 full 100mm faders, 4 large illuminated and configurable push-buttons with replaceable label, and 12 small illuminated pushbuttons per channel.



Two LEDs in each fader strip indicate channel overload (red) and active fader start (blue). Level and gain reduction meters are shown on an OLED display on every channel. Additionally, channel label and channel process parameters are indicated on the OLED as well.

A touch sensitive rotary encoder below every display allows you to change the indicated channel parameters without losing focus on the fader strip.

The OLED display gives outstanding readability of condensed content, even when exposed to bright surroundings.



Quick And Intuitive Operation

Like the OnAir 3000, the operation of the desk is based on Studer's well proven and worldwide accepted "Touch'n'Action" user interface concept. Within minutes, your talent is able to operate the console. If your staff is already experienced with the OnAir 3000, getting familiar with the OnAir 2500 is simple. This is ensured by the clear layout of the user interface.

Within each single fader strip, an OLED (Organic LED) ensures clearest readability of the indicated information. The display shows the name of the assigned channel as well as input level and gain reduction meters. The level meter can be alternatively switched to pre or postfader signal indication or to the corresponding N-X send level. The lower right area of the display is preserved for information about the function assigned to the rotary encoder below the display. During operation, users can choose if the rotary accesses the channels Gain setting or the Aux 1 parameters or any other of the assignable functions. For immediate visual feedback, the selected function is always indicated by an individual graphic icon, which is supported by text based parameter indication, whenever the encoder knob is touched. Two small pushbuttons allow direct access to switching parameters, like On/Off or Pre/Post.



Each faderstrip includes an overload indication LED which flashes whenever the channel signal overloads the input stage. Two large Pushbuttons with replaceable labels on top of each fader are preconfigured as 'REC' and 'TB'. REC routes the channels signal to the Record Bus, TB allows talkback into the channel related return line (available with N-X channel sources).

Below these buttons, a blue LED indicates an open channel (faderstart is active). The LED is followed by two small pushbuttons, which can be customised. Users can configure the buttons, for example with a 'Tally' function.

On the right hand side of each fader, a set of eight small pushbuttons with fixed labels allows direct access to fader related function pages shown in the main screen. By pressing the button at any time, the operator gets immediate access to the channel Input page, the DeEsser, EQ, Dynamics pages, the Insert page or the Aux, N-X, Bus Assign pages.

A simple touch on the respective symbol of a channel function, e.g. equalizer, dynamics, AUX send, immediately opens the corresponding page on the main screen, allowing for quick and easy adjustment. This can be done either by the four rotary encoders below the main screen or directly by touching a selection list within the main screen display.





To prevent accidental activation, pushbuttons and other control elements can be blocked according to user login rights.

At the bottom of each fader strip, two large counter-sunk pushbuttons with replaceable labels are preconfigured as ‘ON’ and ‘PFL’. While PFL switches the channels signal to the PFL bus, ON activates the channel.

The large pushbuttons labelled REC, TB, ON and PFL can be individually customised on request. The central module provides the user with 4 sets of 12 pushbuttons, a monitoring control section, and an ‘On Air’ and ‘Mic On’ indication for the control room and the connected studio. Additionally, this module has an integrated talkback microphone and a socket for the DJ headphone jack.

With the upper left array of 12 pushbuttons, the operator can assign a function to the fader rotary. In the standard console layout, the preconfigured functions to be set are Pan/Balance, Gain/Calibration, Input Selection, N-X Send sum, Aux 1, Aux 2 and N-X 1..4 contribution.

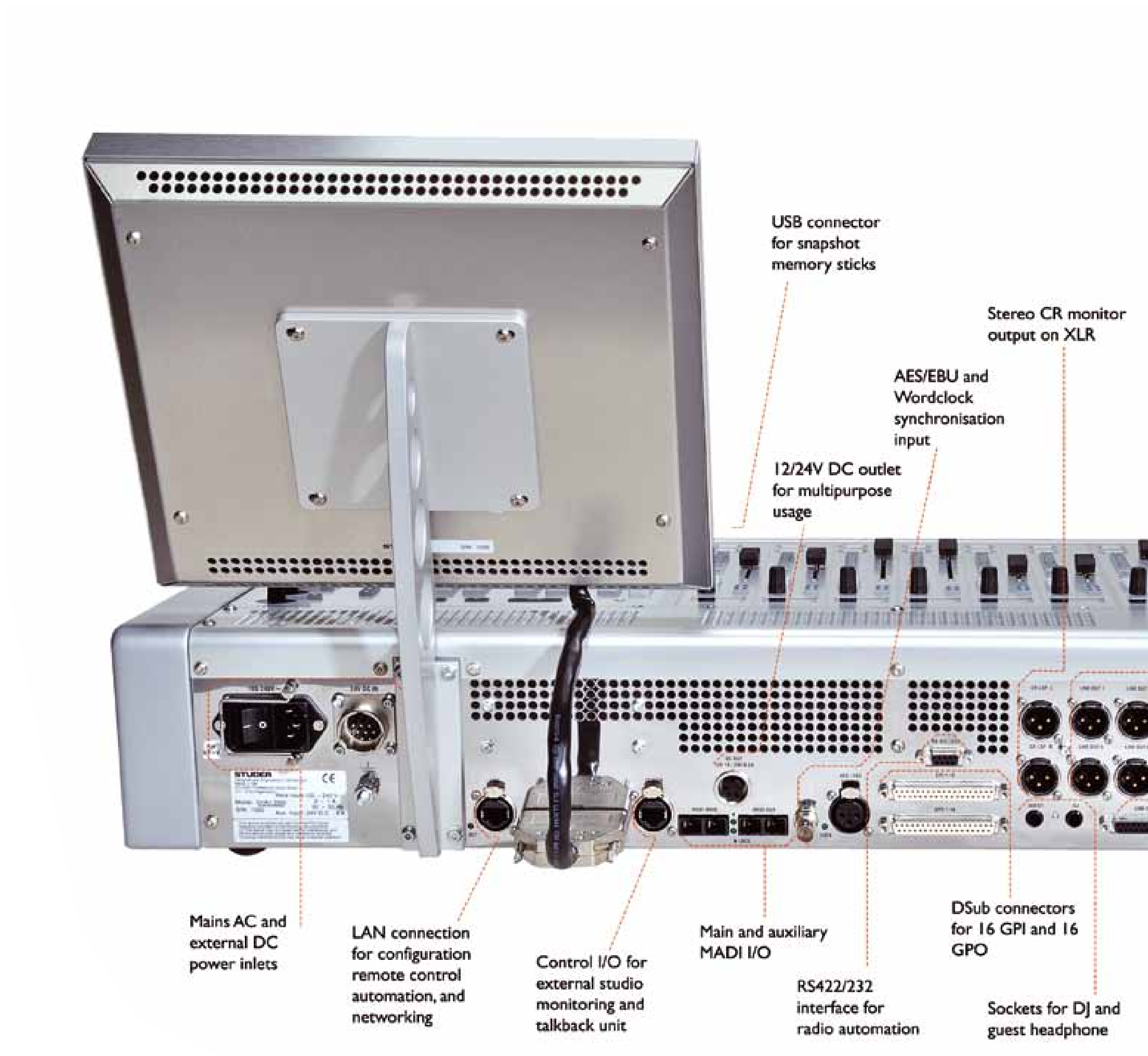
In the talkback section, 12 push-buttons allow communication with the destination studio, talkback group 1 and 2, Aux 1 and 2, N-X 1..4 and Ext 1 and 2. The standard configuration of the console dims the main speakers whenever a talkback button is pressed. The internal microphone represents the default source for the talkback.

The CR monitoring section provides the user with a set of sources, which can be monitored on the control room speakers or the DJ headphone. By default, all summing signals, like Program bus, Record bus, Aux 1 or 2, are directly accessible while other sources can be selected from a list using the rotary encoder by the OLED display. Pressing PFL in a fader strip activates the PFL listening on the integrated speaker. Volume for PFL speaker, control room monitors and DJ headphone can be controlled by rotary encoders with value indication. In the lower left part of the central module, the fourth 12 pushbutton array provides a set of user definable functions. By default, SNAP 1..6 can be assigned to internal snapshots for immediate recall of console setups.

All large buttons are equipped with replaceable key labels. On request, labels and assigned functionality can be customised.

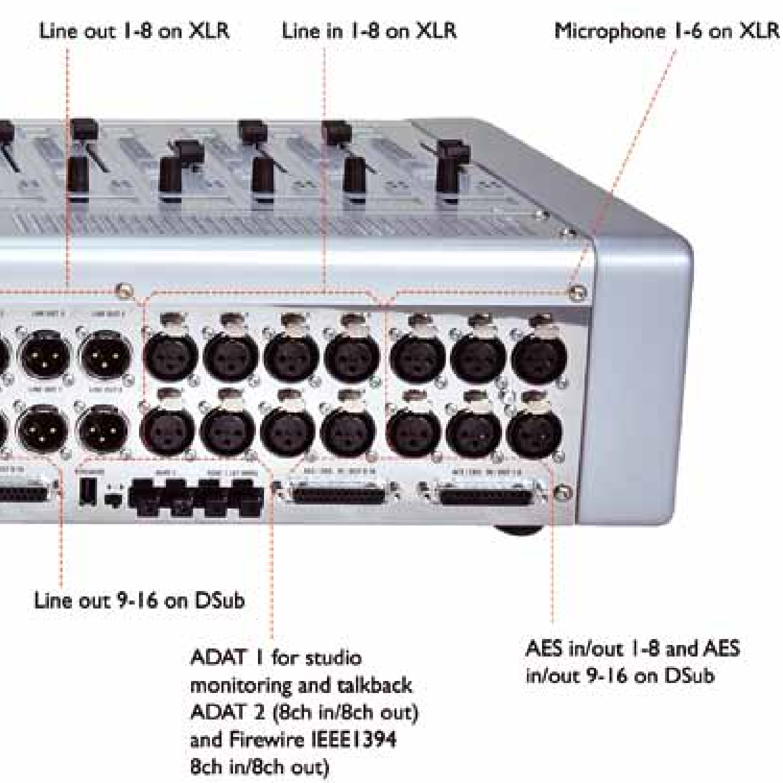


Connectivity





The
OnAir 2500
provides you with an attractive
set of local inputs and outputs in multiple formats. By connecting a Studer D21m I/O Breakout box via MADI, the number and format of the available I/Os can be extended.



Input and output modules
The following D21m input and output cards are available:

- **Microphone / line card, 4 Channels**
  With analogue insert extension connector
- **Analogue Insert card**
  Provides 4 balanced insert send and return paths
- **Line In card, 8 channels**
  24 bit Delta-Sigma A/D converter card
- **Line Out card, 8 channels 24 bit**
  Delta- Sigma D/A converter card
- **AES/EBU card, 8 channels AES/ EBU in, 8 channels AES/EBU out**
  Available either with i/p SRC, with i/p and o/p SRC, or without SRC
- **ADAT card, 2 x 8 channels i/p and 2 x 8 channel o/p**
  With optical interfaces
- **TDIF card**
  Provides 2 TDIF interfaces
- **MADI card**
  Provides optical 64 ch MADI interface
- **GPIO card**
  16 opto-coupler general purpose inputs
  16 open collector general purpose outputs, also available with relays.

The D21m system automatically detects newly inserted cards in real time and sends the appropriate information to the main controller in the OnAir 2500. Additionally, in the case of a card failure an error message is transmitted and displayed on the GUI.

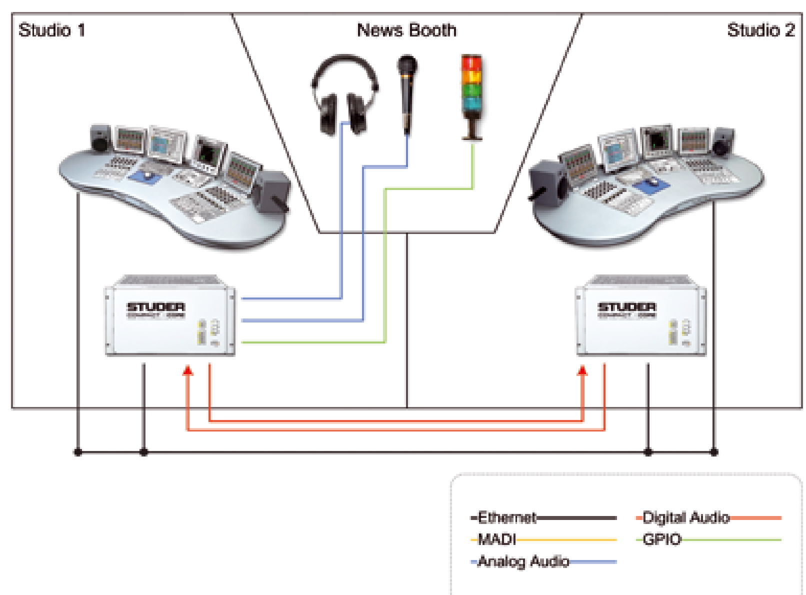
Studer RELINK I/O sharing

The OnAir 2500 can be integrated easily within the Studer RELINK Resource Linking managed I/O sharing system, which can link numerous Studer consoles in various locations of a Broadcast facility to allow audio source and control data sharing across a wide network.

One of the benefits of the Studer RELINK system in comparison to others is that it is based totally on Studer's existing SCore platform which is an integral part of a Studer console architecture, so no additional hardware or breakout boxes are required to complete the network. Communicating over TCP/IP with each other, any combination of Studer Vista (5, 6, 7, 8), the OnAir 2500 and 3000 consoles, as well as Route 6000 can link via RELINK.

RELINK is seamless, scaleable, flexible, and can start with a simple link between two Studer consoles, right through to multi-console systems using a two-step topology where all signals are matrixed through a central device, e.g. the Studer Route 6000 system.

Source selection is transparent, and signal labels are automatically transferred to the consuming locations, so the operator always knows what source is connected. Signal takeover between studios is seamless, so RELINK is well-suited for live transmission switchover. A resilient mic take-over mechanism ensures that mic control parameters such as analogue gain, phantom voltage, etc. are not unintentionaly changed but require concious take-over confirmation. Local monitoring at point of use is turned off automatically to prevent feedback, indicated with red light signalling, automatically following the source, wherever it is used.



A very common application in radio houses is a voice or news booth connected closely to a studio for speech contribution to a broadcast or a recording, while a second studio is used for production. The booth resources (microphone, headphones and indication) are physically connected to one console, usually to the one used most in combination with the booth (the one in Studio 1 in our example). This console provides the monitoring signal for the headphones, controls the microphone parameters as well as the ready/on air indicators. If the second studio (Studio 2) requires the booth for production, I/O Sharing allows forwarding the control of the microphone parameters and the indication from the console in Studio 1 to the one in Studio 2. Via a physical connection (tie line) between both studios, the audio signal is provided to Studio 2. This audio interconnection can be of any type, for example AES3.

The monitoring signal for the headphones is still provided by the console in Studio 1, but the monitoring signal is delivered by the console in Studio 2 via a suitable tie line (e.g. AES3) and routed to the headphones remotely. While Studio 2 works with the booth, it controls the microphone parameters, including analog gain and phantom power. Opening the microphone in Studio 2 activates the red light in the booth, presuming that the 'mic on' parameters are configured accordingly. In this case, existing monitor speakers will be cut remotely as well. Sharing the control information is established via a network connection (Ethernet) between all systems involved.

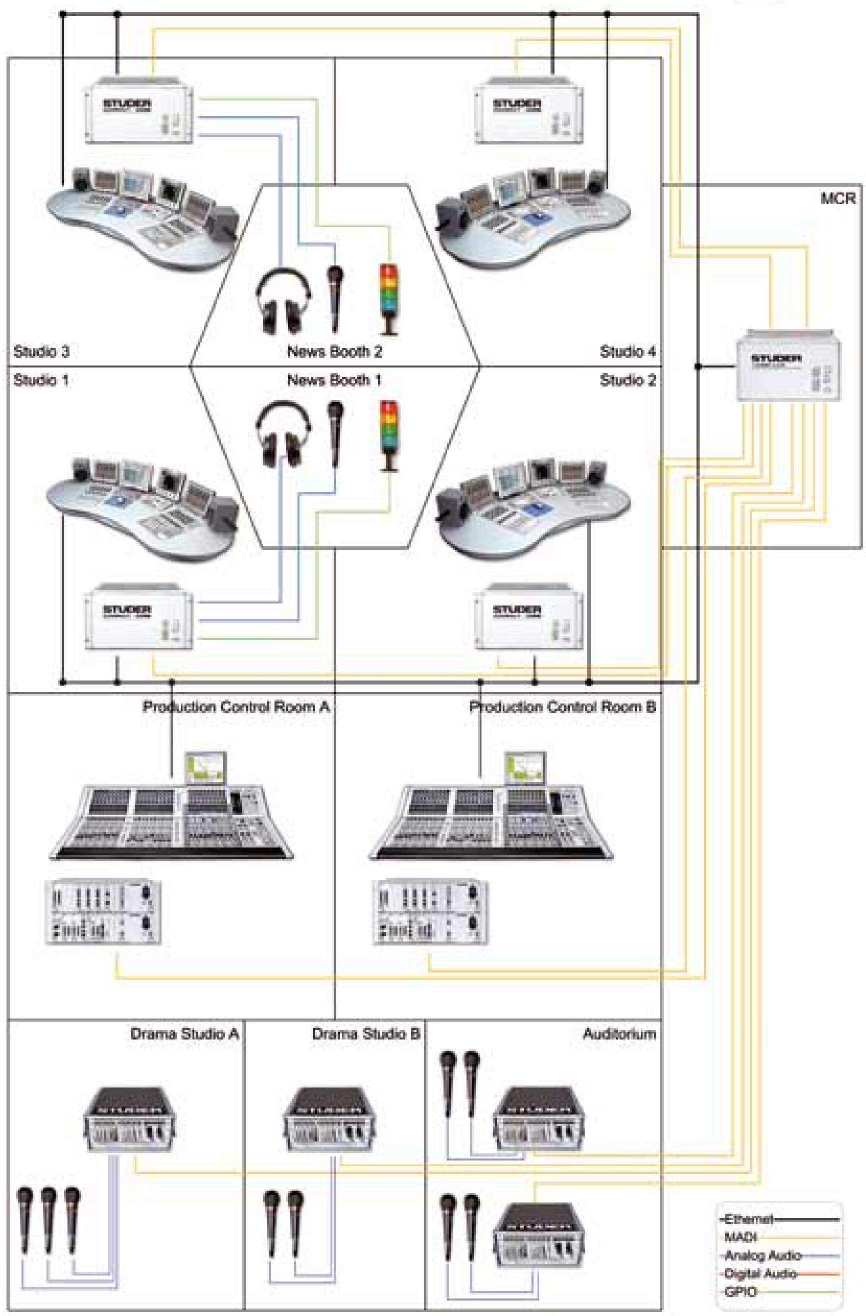
Two-step I/O Sharing is an advanced signal sharing application. It allows sharing of signals between two devices 'through' a third device. In the figure above, 'System A' and 'System B' are not connected directly but through the central router device 'System C'. System A provides a set of three microphones to the router. These microphones are available as NETInputs in the router and can be consumed by System B in the same way as local sources.

This example shows a (radio-) broadcast house where production studios and control rooms are located, in addition to the OnAir studios in the same building. The production studios (Drama A, Drama B and Auditorium) are equipped with D21m stageboxes connected to the Route 6000 in the MCR.

In this way, not only the two Vista 5 consoles in the production control rooms can use mic signals from the stageboxes, but also the four OnAir consoles can use these signals and, if necessary, also get control of the mic parameters.

STUDER RELINK offers probably the most integrated, comprehensive and optimised I/O sharing management available to Broadcasters today.

To utilise STUDER RELINK, consoles must be running at least the following software versions – V4.1 for Vista, V3.1 for OnAir systems and V2.0 for Route 6000 systems.



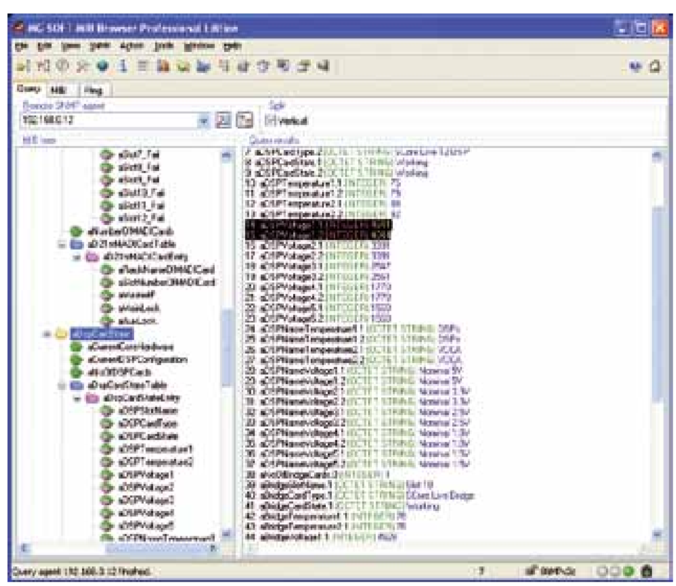
System Surveillance via SNMP

The system state of an OnAir console can be optionally monitored via SNMP messaging. The Simple Network Management Protocol is a common method to monitor and control networked devices independent of type and usage.

The way SNMP is implemented enables two different methods of receiving information from a single or multiple OnAir systems in an IP network. Systems can actively send important status information to the connected network. Special messages (Traps) are triggered when parameters reach or surpass predefined thresholds, e.g. a processor's temperature has risen to a critical level, or a console's 'On Air' state is activated. Additionally, traps are sent on any occurring system alert, e.g. PSU error or synchronisation switch-over. Such active sending does not need any user interaction.

For surveillance issues, users can also request the current status information of system parameters (Polls). This is possible at any time and independent from status and parameter. Thresholds for traps can be configured in a corresponding XML file for each console.

To view SNMP messages from an OnAir system, customers can use any third party SNMP manager software on the market. Usually, such applications combine viewing, logging and filtering functionality with useful features like sending a notification email when a specified trap occurs.



Screen image from third party SNMP manager 'MG SOFT MIB Browser' available as an option from Studer

Radio Integration

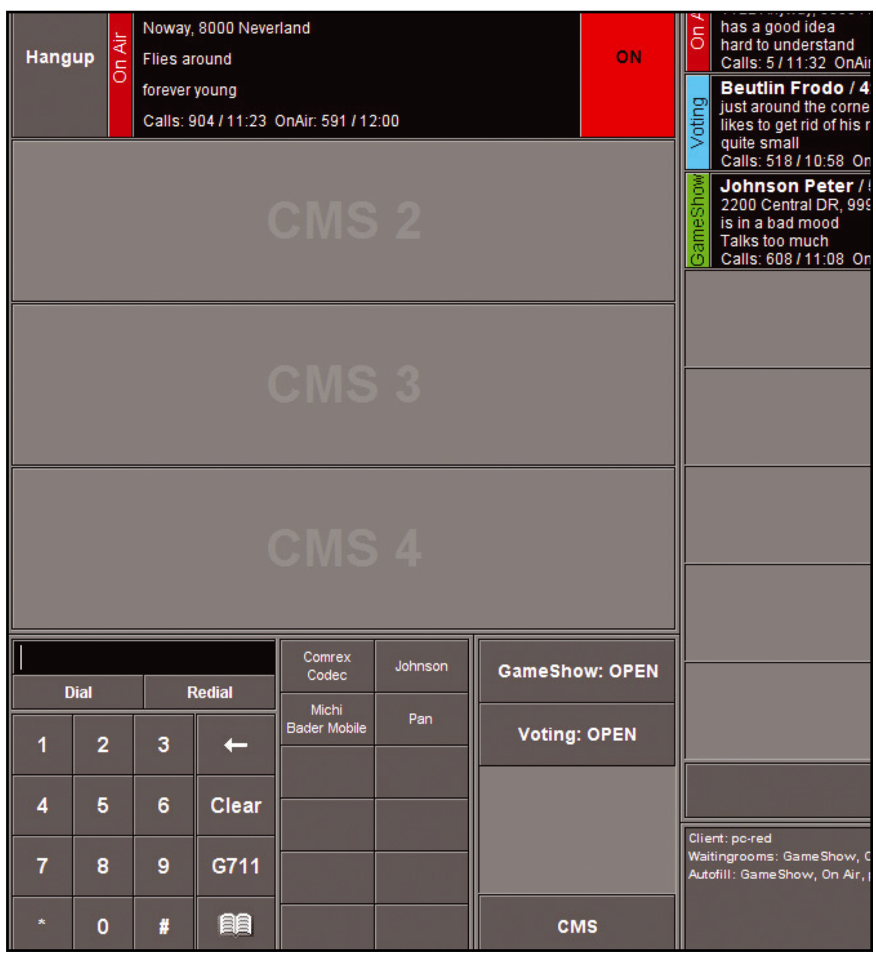
With the OnAir 2500, networking and integration is easy.

Optional support of I/O Sharing allows Studer's sophisticated technology to share signals with other Studer devices regardless of model. In a networked installation with multiple OnAir 2500 and OnAir 3000, Route 6000 and Vista systems, operators can use I/Os from these systems and have full access to all parameters of shared I/Os.

The OnAir 2500 allows integration with radio automation systems. Remote control in both directions from the console to the automation system and vice versa, is possible via Monitora option. A single playout session can be established via serial interface, while multiple sessions are possible via TCP/IP. In combination with the audio connection over IEEE1394 Firewire with 8ch I/O this means an effective reduction of wiring complexity and allows the user to be on-air ready, fast.

Router control via ProBel is optionally available. The console is able to send crosspoint commands to a Router using the comfortable main screen as a controller, but it is also possible to activate output patches in the router. Patches are sets of predefined crosspoints, which can be activated by pressing a single button on the console surface.

The OnAir 2500 can also be integrated with Studer's Call Management System, CMS. This system replaces the usual telephone in a studio by software clients, allowing sophisticated management of incoming calls in a networked environment. The CMS is able to automatically route incoming callers to pre-configured fader channels, allowing caller names to be shown dynamically as fader channel labels. Finally, the optional SNMP functionality enables the system to send information into the network to monitor the system's health. Nearly any parameter can be selected for surveillance.



OnAir 2500 Main Features

- Ergonomic, easy to learn "Touch'n'Action" user interface
- Complete system overview and fast parameter access via fader screens
- 2 master buses PRG A, REC
- 8 weighted stereo mix-minus buses configurable as AUX sends
- 2 AUX stereo buses
- 8 assignable inserts (stereo) plus analogue mic inserts
- Each Channel with
- 4 band parametric EQ
- Limiter, Compressor, Expander, Gate
- De-Esser
- Mic Inputs with High Pass Filter and analogue insert
- One PFL circuits
- Integrated PFL speaker in chassis (in Fix Frame version only)
- External PFL function (e.g. for playout system)
- Audition bus
- CR monitoring with quick listening function on all inputs and outputs
- One independent studio monitoring/talkback circuit
- Integrated talkback microphone
- Different audio I/O modules as option by D21m series extension
- Configurable control signals (GPIOs)
- All buttons freely assignable
- Snapshots, user management, user logins
- Graphical user interface with colour TFT touch screen
- Interface to radio automation system(s)
- Remotely controllable via remote GUI or Probel protocol
- Redundant power supplies
- Input and output router with graphical display
- Fixed Frame version for easy and fast installation
- Completely adaptable to customer needs
- I/O sharing of audio sources

Inputs

- 6x Mic XLR
- 4x Stereo line XLR
- 8x Stereo AES/EBU with Input SRC on D-Type
- ADAT1 (HCS 200/230µ)
  (for studio monitoring with 1.943.444 or 1.943.447)
- ADAT2 (POF 980/1000 µ Fiber Wire) or Firewire IEEE-1394
- 1x MADI with 56 IN optical. AUX connector for redundant wiring
- 1x TB mic on desk

Outputs

- 4x Stereo Line XLR
- 4x Stereo Line D-type
- 1x Stereo CR Loudspeaker
- 8x Stereo AES/EBU D-Type
- 1x DJ Headphone (2 connectors)
- 1x GUEST Headphone
- 1x PFL speaker on desk (in Fix Frame version only)
- 1x ADAT1 (for Studio monitoring)
- 1x ADAT2 or Firewire (IEEE-1394)
- 1x MADI with 40 OUT, AUX connector for redundant wiring

Technical Specifications

General
Level specs, digital, in dBFS: dB, referenced to full modulation (dBFS, dB Full Scale)
Level specs, analogue, in dBu: 0 dB Ø 0.775 Vrms
Sampling rate: 48 kHz ±50 ppm (internally synchronized)
Headroom adjustable: 0 to 20 dB
Default setting: 9 dB
Output Level: 15 dBu @ 0 dBFS
All input faders set to their 0 dB position. External analogue sources: source impedance < 200 Ω. Frequency range: 20 Hz to 20 kHz, if not stated otherwise.

Microphone inputs
Input sensitivity: –60 dBu…26 dBu for 0 dBFS
Gain setting: in steps of 1dB
Frequency response: 30 Hz…20 kHz, –0.3 dB
High pass filter (12 dB/Octave): 75 Hz
Input impedance: 1.8 kOhm
Insert level (for 0 dBFS) +15 dBu
Dynamic range: 107 dB
THD+N (30 Hz … 20 kHz, –30 dBFS): –100 dBFS
THD+N (1 kHz, –1 dBFS): –95 dBFS
Equivalent input noise (200 Ω Ri, max gain): –124 dBu
Crosstalk, 1 kHz: –100 dB
Phantom power, switchable: 48 V

Line level inputs
Level (for full scale) 15 or 24 dBu fixed (jumper), or 7...26 dBu adjustable
Input impedance min. 10 kΩ
Frequency response 20 Hz...20 kHz –0.2 dB
THD & N (35 Hz … 20 kHz, –30 dBFS), input level fixed max. –108 dBFS
THD & N (1 kHz, –1 dBFS), input level fixed max. –97 dBFS
Crosstalk 1 kHz max. –110 dB

Digital inputs/outputs
Input/Output impedance 110 Ω
Output level (into 110 Ω) 5V
Input Sampling rate with SRC 32 … 108 kHz

Analogue outputs
Level (for full scale) 15 or 24 dBu fixed (jumper), or 7 … 26 dBu adjustable
Output Impedance 50 Ω
min. Load at +24 dBu 600 Ω
Frequency response 20 Hz … 20 kHz –0.2 dB
THD & N (20 Hz … 20 kHz, –30 dBFS), input level fixed max. –104 dBFS
THD & N (1 kHz, –1 dBFS), input level fixed max. –93 dBFS
Crosstalk 1 kHz max. –110 dBFS

Equalizer
4 Band, each band sweepable 20 Hz…20 kHz: ±18 dB
Q-factor 0.27 … 8.7

Dynamics
Dynamic level 0 dB … +24 dB
Dynamics ON/OFF

Limiter
Threshold -39 … + 9dB
Attack time 0.2 msec … 1 msec
Release time 10 msec … 10 sec

Compressor
Threshold -87 … +9 dB
Ratio 20:1 … 1:1
Attack time 0.2 msec … 20 msec
Release time 10 msec … 10 sec

Expander
Threshold -87 … +9 dB
Ratio 20:1 … 1:1
Attack time 0.2 msec … 1 msec
Release time 10 msec … 10 sec

Noise Gate
Threshold -87 … +9 dB
Attenuation -48 dB … 0 dB
Attack time 0.2 msec … 1 msec
Release time 10 msec … 10 sec

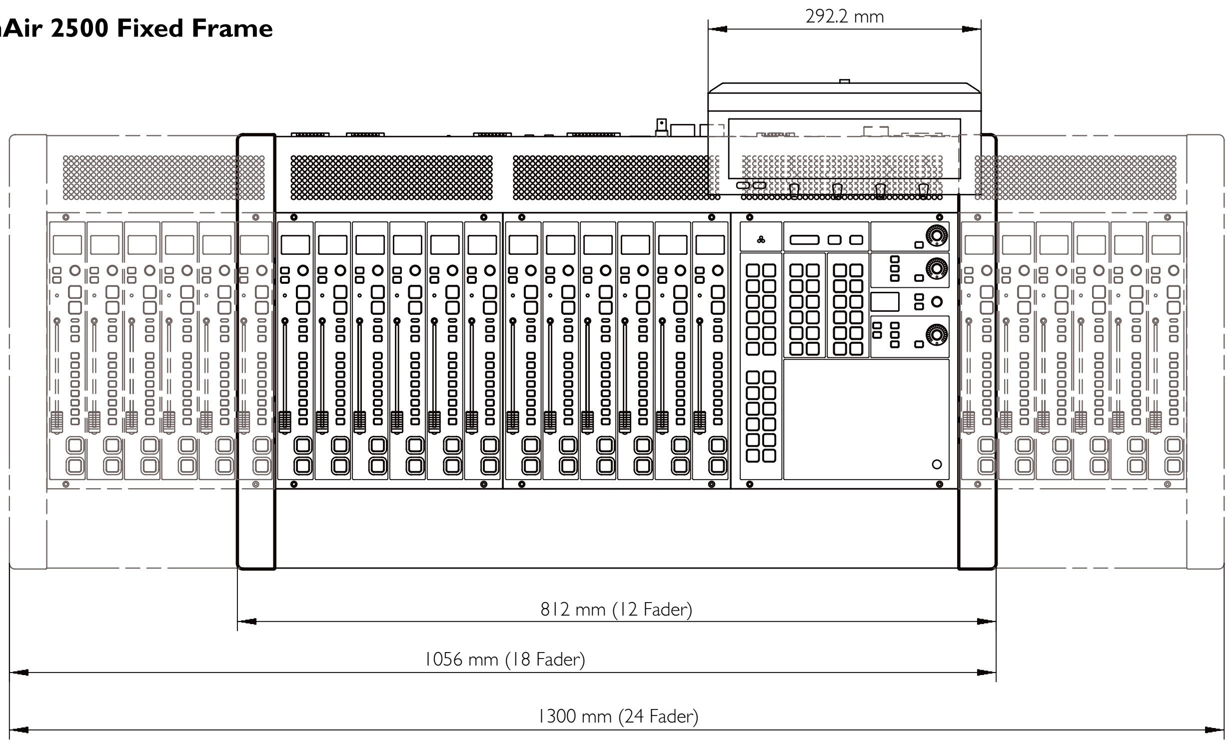
De-esser
Frequency range 4 kHz … 14 kHz
Q-factor 0.27 … 8.7
Threshold -87 dB … + 8 dB Auto Mode
Ratio 20:1 … 1:1

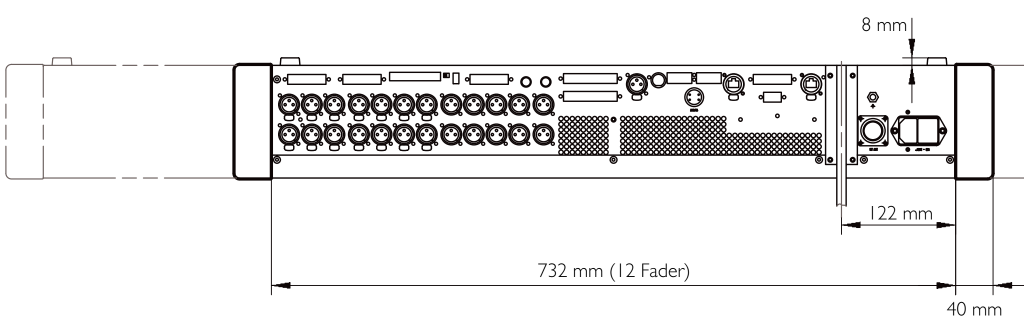
Power supply
Mains voltage: 100 to 240 V, 50/60 Hz (auto-ranging)
Power consumption Desk: typ. System 100 W

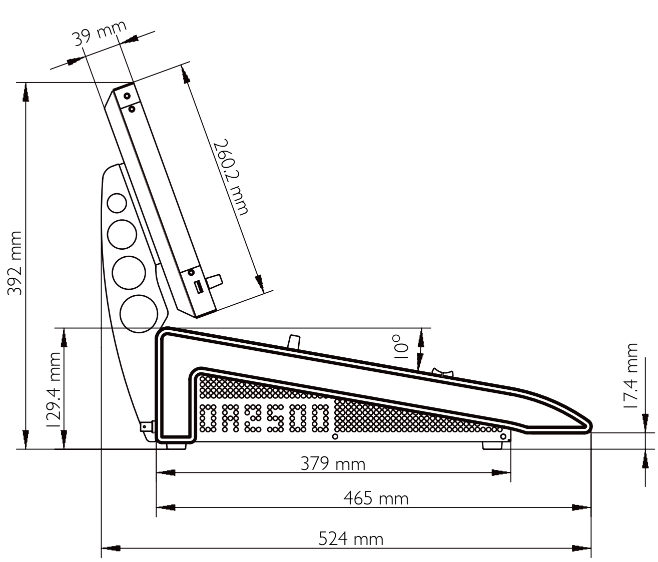
Weight
OnAir 2500 12 fader 17 kg

Note:
We reserve the right to change specifications as technological progress may warrant. Data subject to change without notice

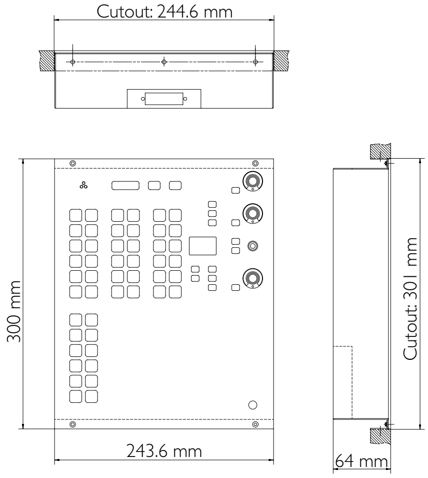
OnAir 2500 Fixed Frame



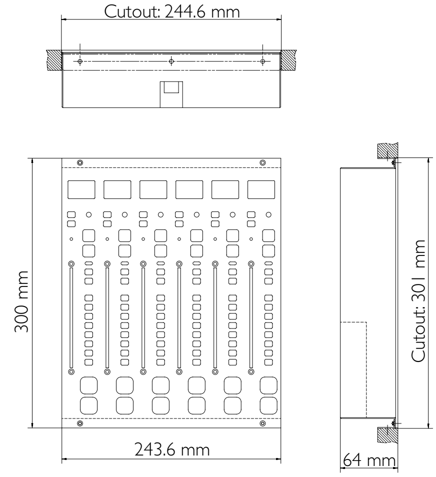




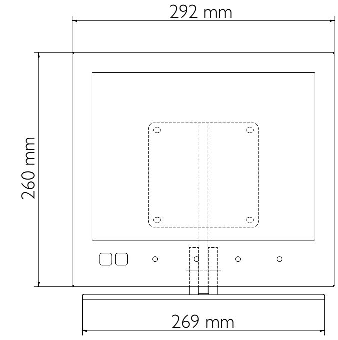
OnAir 2500 Modulo



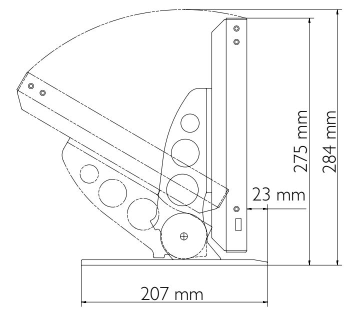
Central Module

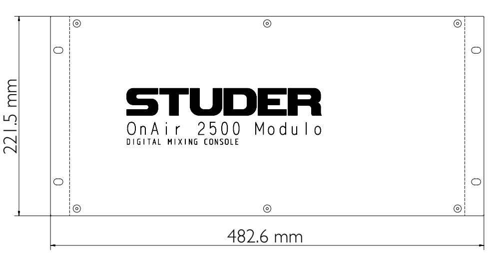


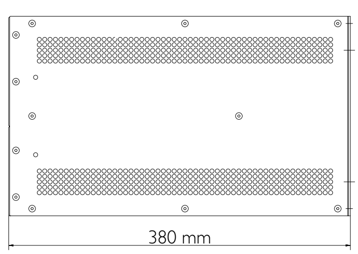
Fader Module



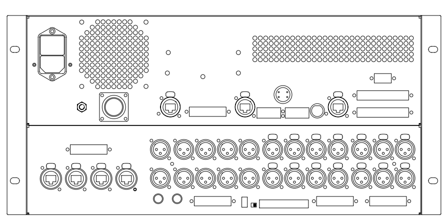
Screen Module







Core Rack (Front View)



(Rear View)

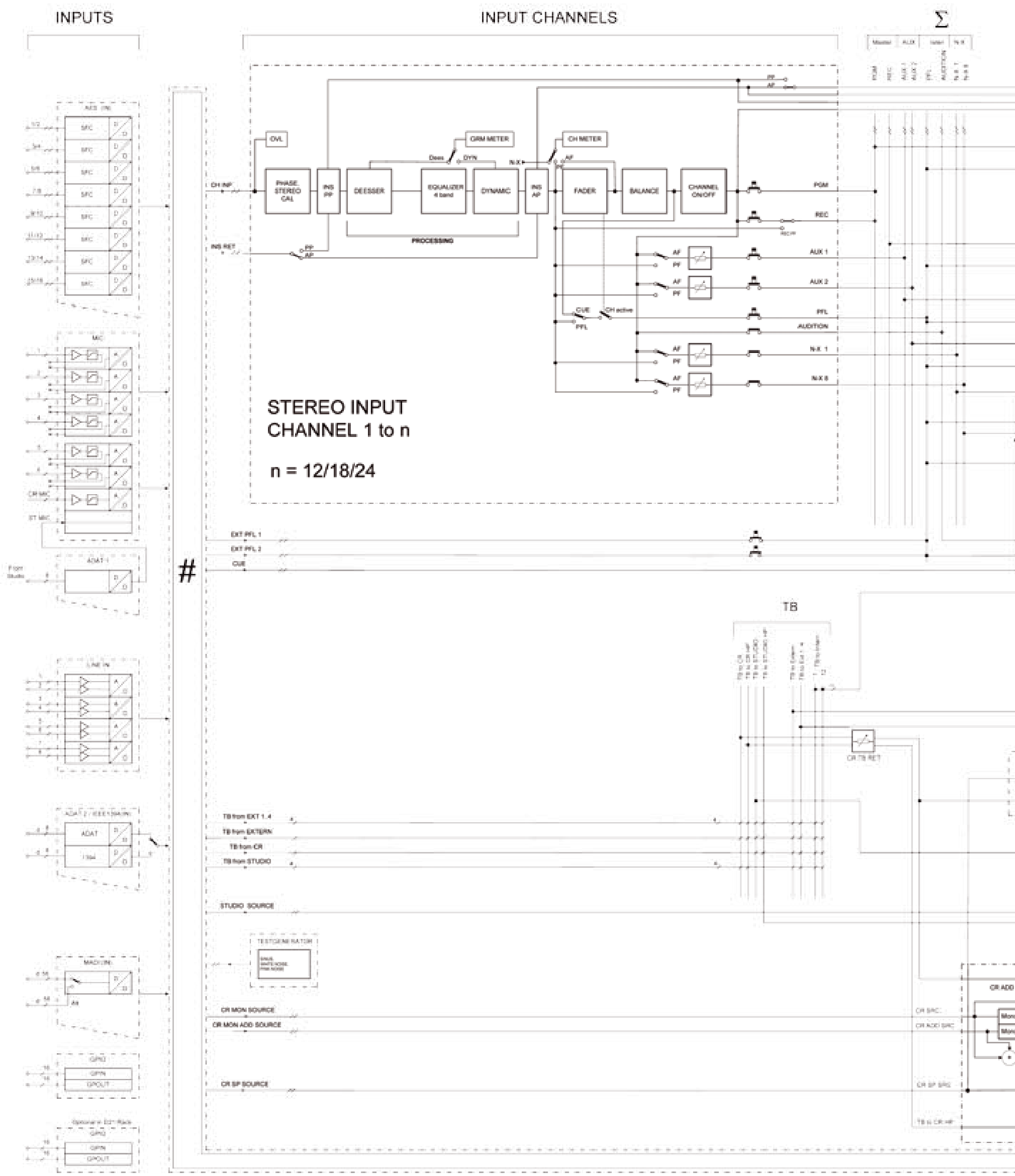
Please note that the maximum distance between the
CORE FRAME and MAIN SCREEN and CENTRAL MODULE is 2m

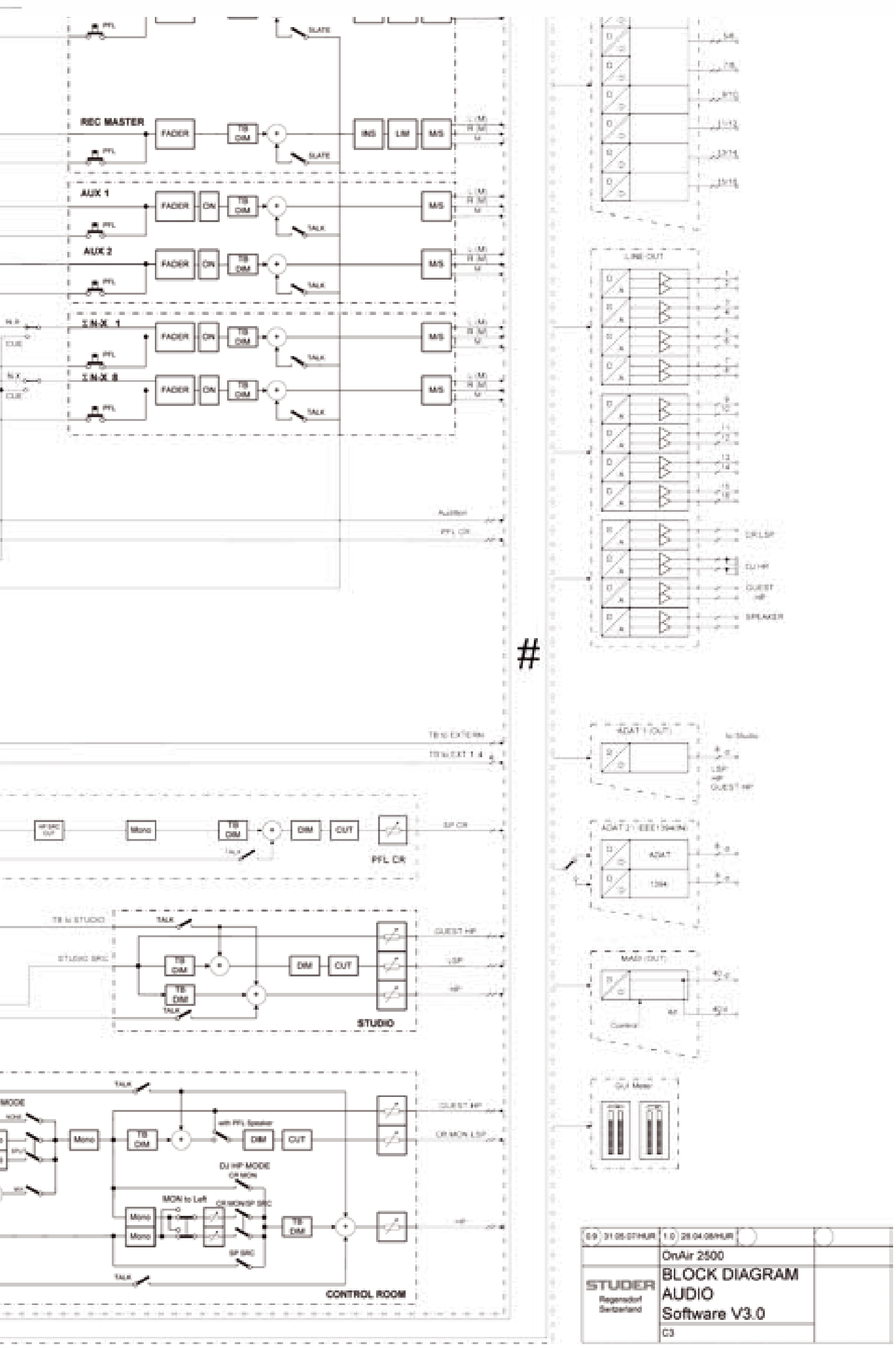
Service and Support



Studer has produced and delivered far more than a thousand time-tested and proven digital OnAir mixing consoles throughout the world, many of which are in use 24 hours a day, seven days a week. Due to the modular design and the self-configuring software, individual hardware items can be easily and quickly exchanged at the customer's site. We at Studer know that reliability is vital to our customers. Therefore Studer offers world wide service and support for its products. Studer also offers operator training and service on-site or in the factory. Please consult your local Studer representative.

Block Diagram




REC MASTER
FADER
INS
LIM
M/S
AUX 1
AUX 2
LINE OUT
#
PFL CR
STUDIO
CONTROL ROOM
OnAir 2500
BLOCK DIAGRAM
AUDIO
Software V3.0
STUDER
Regensdorf
Switzerland





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